



Australian Government

Patent Office  
Canberra

I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003904005 for a patent by SIMON ANDREW HUBER MUIR as filed on 01 August 2003.



WITNESS my hand this  
Eighteenth day of July 2005

A handwritten signature in dark ink, appearing to read "J.P. + C.".

JANENE PEISKER  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES

Best Available Copy

Available Copy

1

**AUSTRALIA**

**PATENTS ACT 1990**

**PROVISIONAL SPECIFICATION**

for the invention entitled:

**"Dispenser Device"**

**The invention is described in the following statement:**

## DISPENSER DEVICE

### 5 Field of the Invention

This invention relates to a dispenser. In a particular non-limiting aspect it relates an in-line dispenser which may be used for adding soluble or dispersible fertilisers and/or other materials to a hose or other watering system for gardens and lawns.

10

### Background of the Invention

Fertilisation of gardens particularly home gardens is quite common. Typically a home owner may spread fertiliser by hand on lawns/garden beds prior to watering the lawns/gardens to wash in the fertiliser to the plant roots.

15

Whilst this approach is reasonably effective, it requires the additional step of spreading the fertiliser as well as a watering step. Furthermore, it is difficult to meter out fertiliser evenly by hand. As the fertiliser is generally thrown over an area in concentrated crystalline form, it may even end up directly in contact with the roots or leaves of a plant and cause localised burning of the plant where contact occurs.

20

Thus there is a need for a simple approach to applying fertiliser to lawns/plants which is not labour intensive and which can be used to facilitate a relatively even application of fertiliser to the ground being watered.

25

### Disclosure of the Invention

The invention provides in one aspect an in-line dispenser for adding a dispersible solid to a flow of liquid comprising,

30

a liquid conduit having a tubular wall extending between an inlet and an outlet, and

a container for the dispersible solid having at least one wall comprising at least a part of the tubular wall,

wherein the at least a part of the tubular wall is permeable to liquid but is substantially impermeable to the dispersible solid, whereby liquid flowing through the conduit from the inlet to the outlet may flow from within the liquid conduit into the container to come into contact with the dispersible solid to dissolve or otherwise disperse the dispersible solid in the liquid in a form which allows the liquid containing the dispersed solid to re-enter the liquid conduit.

10 The dispersible solid may comprise any solid which can either dissolve in the liquid or be in any other way dispersed or suspended in the liquid in a form which allows it to pass through the permeable wall. It may comprise a particulate material such as fertiliser crystals. The size of the particulate material will be such as to substantially prevent it passing through the permeable tubular wall. It may typically comprise a common fertiliser such as potassium, phosphates or nitrates. Alternatively or additionally, it may comprise a material for treating lawns/plants such as an insecticide, or a herbicide. It may comprise mixtures of the foregoing.

Typically, the liquid will comprise water. The water may be used to water lawns/plants in a typical home garden.

The tubular wall may be rendered permeable by virtue of including one or more holes or slots therethrough. The holes or slots are suitably of relatively narrow diameter or width to prevent the particulate material passing therethrough. For example the diameter or width may range within 0.2 to 3mm. The holes may take the form of circular or irregularly shaped openings.

Alternatively the tubular wall may be formed of a material which is itself inherently permeable to water or other liquid. For example, it may comprise a fibrous material. The fibrous material may be woven or non-woven. Thus it may be porous to liquid in any way as is known in the art, although it is anticipated most situations, a

construction in which openings such as holes or slots are used to provide permeability is one of the most preferred methods of performing the invention.

The liquid conduit may be mounted co-axially in an outer barrel. Thus the space  
5 between the outer barrel and liquid conduit may comprise the container for holding the dispersible solid.

The ends of the co-axially mounted outer barrel and liquid conduit may be joined in such a manner as to close off the container.

10

Attachment means such as a screw thread may be provided at the inlet and outlet to the dispenser. The screw threads may be used to attach connectors such as hose connectors. Thus the in-line dispenser may be fitted in-line to a hose via the hose connectors.

15

Filtering means such as filter mesh may be provided to filter out any large particulates in the water travelling through the liquid conduit. Suitably, the filter mesh is provided downstream of the container.

20 The dispenser according to the invention may typically be manufactured of a relatively inert and rust-proof material such as a thermoplastic. It may be injection moulded in several components. The container may be permanently sealed. It may be disposable once the dispersible solid has been completely entrained in the water flowing through the liquid conduit. Thus, window means may be provided in the  
25 outer barrel to view the level of dispersible solid in the container.

As the in-line dispenser may be used in a system for watering a garden or lawn, the invention also covers any such system incorporating in-line dispensers as hereinbefore described. Such systems may include an array of sprinklers. They may  
30 also include a subsurface hose for feeding water to the sprinklers.

## 5

The in-line dispenser may also include one way valve means arranged to prevent backflow of water containing the dispersible solid entrained therein.

Preferred aspects of the invention will now be described with reference to the  
5 accompanying drawings.

**Brief Description of the Drawings**

Figure 1 shows an exploded view of a dispenser with a cut out portion  
10 according to the invention;

Figure 2 shows the dispenser of Figure 1 in assembled form;

Figure 3 shows a cross-section of the dispenser of Figure 2 taken along its elongate axis;

Figure 4 shows a sprinkler array incorporating the dispenser of the invention.;

15 Figure 5 shows an exploded view of an alternative dispenser construction with a cut out portion according to the invention;

Figure 6 shows the dispenser of Figure 5 in assembled form; and

Figure 7 shows a cross section of the dispenser of Figure 5 taken along its elongate axis.

20

**Detailed Description of the Preferred Embodiment**

The various elements identified by numerals in the drawings are listed in the following integer list.

25

**Integer List**

- |    |   |                |
|----|---|----------------|
|    | 1 | Dispenser      |
|    | 3 | Main body      |
| 30 | 5 | Hose connector |
|    | 7 | Hose connector |
|    | 9 | Screw member   |

6

	11	Screw thread
	13	Screw thread
	15	Screw thread
	17	Screw coupler
5	19	Screw coupler
	21	Spigot
	23	Spigot
	25	Outer barrel
	27	Window
10	29	Inner conduit
	31	Hole
	33	Annular container
	35	Particulate fertiliser
	37	Filter mesh
15	39	Tap
	41	Hose connector
	43	Hose
	45	Sprinklers
	51	Dispenser
20	53	Main body
	54	Filter mesh
	55	Hose connector
	57	Hose connector
	59	One way valve
25	61	Slots
	63	Annular restriction
	65	Valve member
	67	Annular gasket material
	68	Valve stem
30	69	Valve face
	70	Valve guide
	71	Tension spring

7

- 73 Venturi shoulder
- 75 Arrow
- 77 End piece
- 79 Collar
- 5 80 Outer barrel

Referring to Figures 1 to 3 of the accompanying drawings there is shown a dispenser generally designated 1 which comprises a number of components which may typically be produced by a plastics injection moulding process. The individual  
10 components are shown most clearly in Figure 1.

The dispenser 1 comprises a main body 3 provided with hose connectors 5 and 7 at the outlet and inlet thereof respectively. These may be any type of hose connector available on the market such as the ones illustrated or "snap-fit connectors which are  
15 commonly used on garden hoses.

The inlet end of the main body incorporates an internal thread into which the screw member 9 may be screwed to close off the annular container 33 formed in the main body.  
20

Thus the screw member 9 includes a screw thread 13 which can be screwed into the corresponding internal screw thread provided in the outer barrel 25 of the main body. A screw thread 11 of narrower diameter extends from the screw member 9 to connect with the screw thread of the screw coupler 17 forming part of the hose connector 7.  
25 A spigot 21 for connection with a hose or pipe is secured to the main body by the screw coupler 17. A barb or similar feature may be included on the spigot to assist retention of the spigot in a hose.

Similarly, the screw thread 15 provided at the outlet of the main body corresponds in  
30 function to the screw thread 11 to secure the hose connector 5 at the outlet to the screw coupler 19 of the hose connector. A spigot 23 is also provided.



The outer barrel includes a window 27 to view the particulate fertiliser 35 held in the annular container 33 defined between the inner conduit 29 and the outer barrel 25.

5 A number of holes 31 which are small enough to prevent the bulk of the particulate fertiliser solid 35 from passing therethrough in undissolved form are provided to allow communication between water flowing through the inner conduit 29 and the annular container. This allows the water to dissolve or otherwise entrain the particulate fertiliser so that it joins the flow of water travelling through the inner conduit 29.

10

Particulate materials in addition to or other than fertiliser may also be provided in the container for entraining in the water. They may be entrained by solution or by suspension. They may include microcapsules which can contain fertiliser or treatment chemicals.

15

Whilst the illustrated embodiment shows holes 31, it is to be appreciated that any method of rendering the inner conduit permeable to water should also be suitable provided the method substantially prevents the undissolved or undispersed particulate fertiliser or other material from passing through the inner conduit whilst allowing the dissolved or suspended material to flow into the inner conduit.

20

A filter mesh 37 is provided near the outlet of the inner conduit to catch any small pieces of grit or particulate fertiliser which may be entrained in the water flow through the inner conduit.

25

It can be seen from Figure 4 that a dispenser 1 according to the invention may be added in line to a typical garden watering system where a tap 39 is connected via a conventional hose connector 41 to a hose 43. The hose directs liquid through the dispenser and hence to a series of sprinklers 45.

30

It can be seen that the invention allows fertiliser or other material to be continuously dissolved or dispersed in liquid as it travels through the hose and inner conduit and

therefore reduces the likelihood of excessive concentration of fertiliser or other materials by comparison with hand distribution methods whilst at the same time providing a convenient method of distribution which does not require an application step in addition to the step of watering.

5

Referring to Figures 5 to 7 of the accompanying drawings, it can be seen that the dispenser construction generally designated 51 in broad respects resembles that described with reference to Figures 1 to 3.

10 In particular, it includes a main body 53 having a filter mesh 54 sandwiched between the bottom of the screw threaded end piece 77 and end of the hose connector 55. The screw threaded collar 79 releasably holds the components together and allows removal of the filter mesh for cleaning as required.

15 Hose connectors 55 and 57 are provided at opposite ends of the dispenser to allow it to be connected in line to a hose. Alternative fittings may be used in this regard. For example, the hose connector 57 may be replaced with a connector which allows the dispenser to be connected directly to a tap, especially to the screw thread of a tap. For this purpose, a female screw thread fitting similar to the screw couplers described  
20 with reference to Figures 1 to 3 may be provided as part of the assembly for direct connection to a tap outlet.

One feature of difference between this later embodiment and the earlier one comprises the one way valve 59 located at the inlet end of the dispenser to prevent  
25 backwash of water laden with fertilizer into the tap and associated water delivery systems.

The use of the screw threaded end piece 77 and screw threaded one way valve 59 joining the screw threaded ends of the outer barrel 80 allows easy assembly and  
30 disassembly.

10

The dispenser is also provided with slots 61 rather than round holes to assist with improving the flow of water out of the central part of the dispenser through the fertilizer and back again.

- 5 An annular restriction 63 provided centrally in the dispenser is also included to increase turbulence and hence facilitate dispersion of the particulate fertilizer in the water.

10 Whilst various types of one way valves can be used, the very simple form of valve shown in the drawings is suitable for most applications.

The one way valve comprises a valve member 65 mounted on a valve stem 68.

- 15 The valve member is provided on its sealing surface with an annular gasketing material 67 for sealing against the valve face 69.

20 A valve guide 70 is provided to both hold and slidably guide the valve stem in association with the tension spring 71 which urges the valve member into sealing abutment with the valve face.

- It can be seen that water pressure in the direction of the arrow 75 providing water from a tap or other source presses against the valve member to open it and allow flow through of water. Pressure in the reverse direction automatically results in the spring acting in the same direction as the spring tension to close the valve.

- 25 An annular venturi shoulder 73 may also be provided in the one way valve component to assist with regulating pressure of water traveling through the dispenser.

- 30 Whilst the above description includes the preferred embodiments of the invention, it is to be understood that many variations, alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously

11

described without departing from the essential features or the spirit or ambit of the invention.

5 It will be also understood that where the word "comprise", and variations such as "comprises" and "comprising", are used in this specification, unless the context requires otherwise such use is intended to imply the inclusion of a stated feature or features but is not to be taken as excluding the presence of other feature or features.

10 The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that such prior art forms part of the common general knowledge in Australia.

15 Dated this 1st day of August 2003  
Simon Andrew Huber Muir  
by his patent attorneys Morcom Pernat

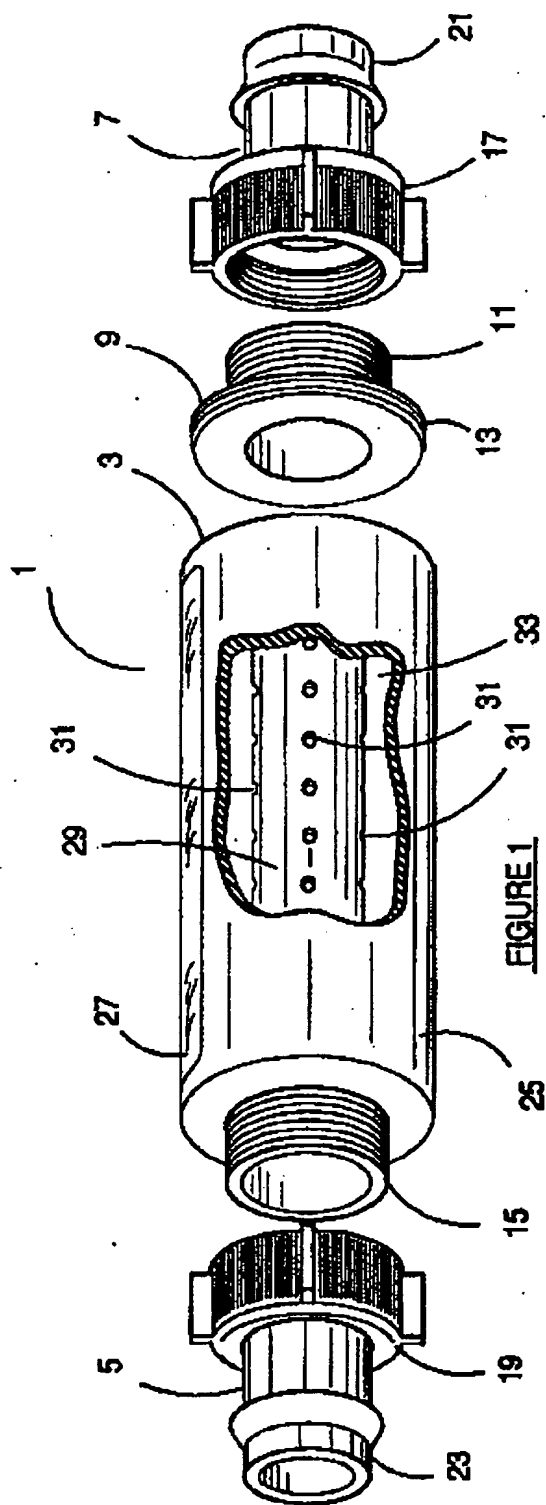


FIGURE 1

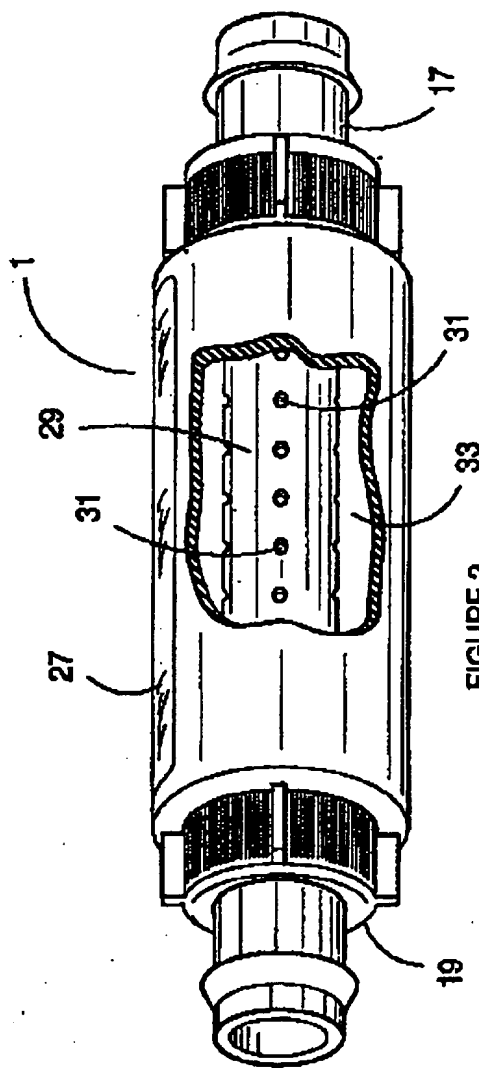


FIGURE 2

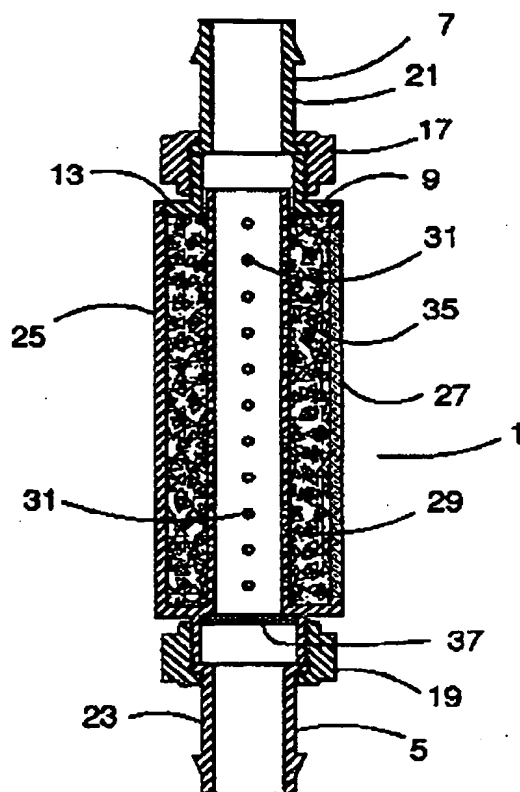


FIGURE 3

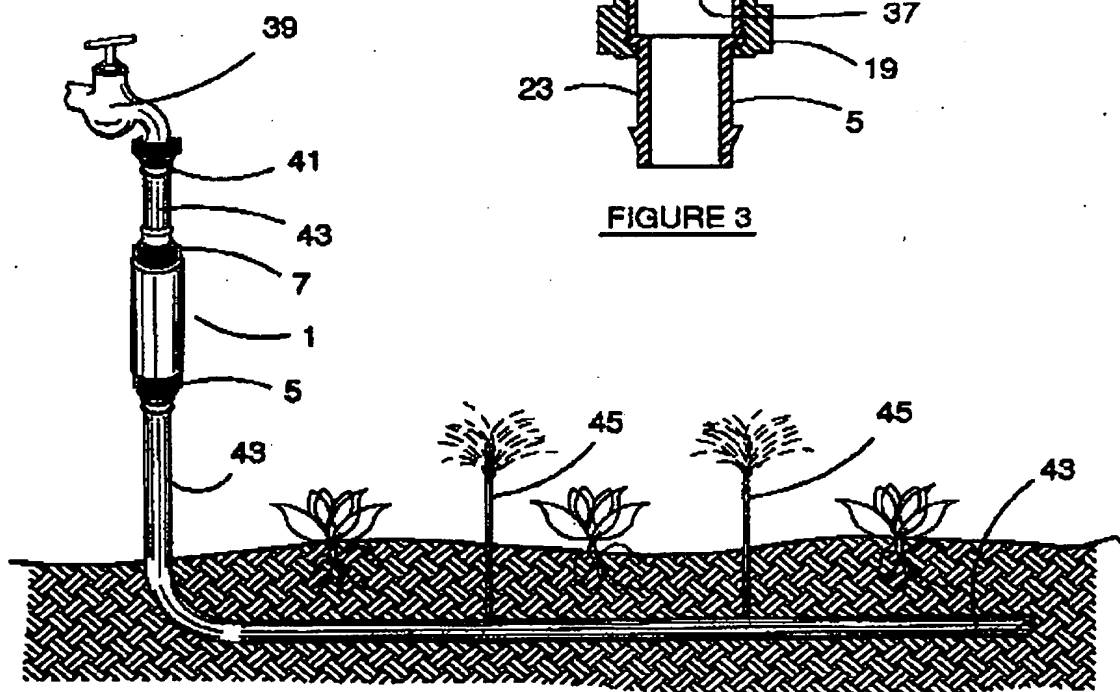


FIGURE 4

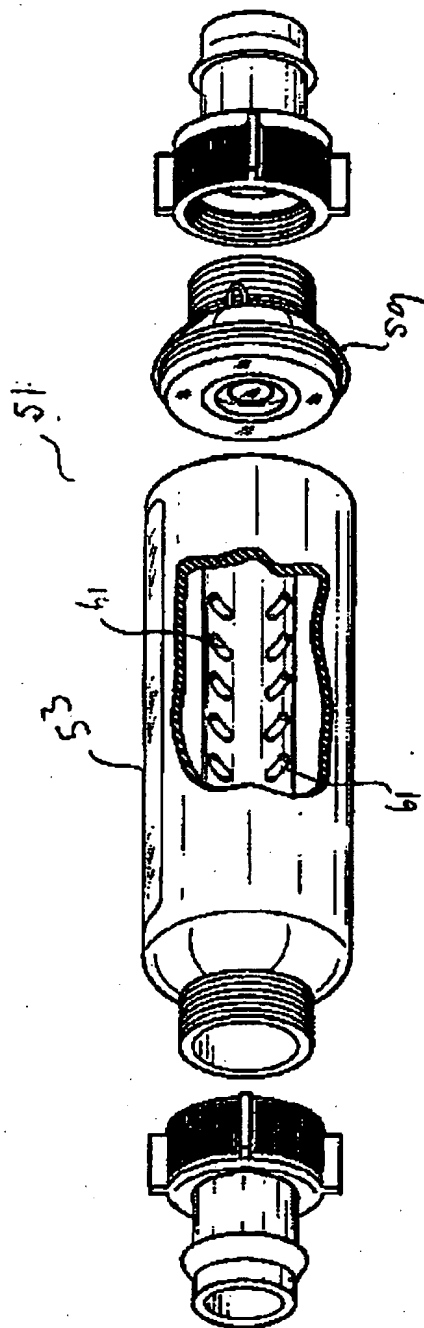


FIGURE 5

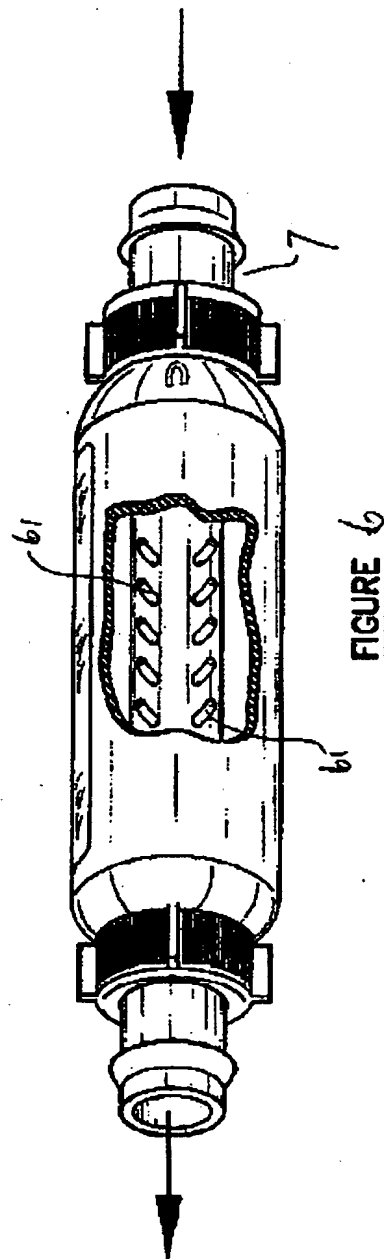


FIGURE 6





**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☒ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**